

Attorney Docket No: HI-019



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A.W.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

LEE, Jin Soo et al.

Serial No. 09/666,281

Filed: September 21, 2000

For: MULTIMEDIA DATA STRUCTURE REFLECTING CHANGE OF USER
RELEVANCE FEEDBACK AND METHOD OF DETERMINING WEIGHTS
OF IMAGE FEATURES OF MULTIMEDIA DATA

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Confirmation No. 8469

Examiner: Mahmoudi, H.

Group Art Unit: 2175

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REQUEST FOR RECONSIDERATION

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The following amendments and remarks are submitted in response to the second non-final Office Action mailed on January 31, 2003, in connection with the above-identified application.

Claims 1-20 are pending.

Reconsideration of the application is respectfully requested for the following reasons.

In the Office Action, the Examiner rejected claims 1-3 and 6 under 35 U.S.C. §103(a) for being obvious in view of a combination formed between the Ma and Liddy patents. Applicants traverse this rejection for the following reasons.

Claim 1 recites a multimedia data structure which reflects a change of user relevance feedback for determining weights of image features used for an image search. The data structure includes (a) information describing at least one feature of a certain image, (b) recent user

feedback information based on user relevance feedback, and (c) whole feedback information based on the user relevance feedback.

In order to establish a *prima facie* case of obviousness for claim 1, two requirements must be satisfied. First, the cited references must teach or suggest all the features in claim 1. Second, there must have been some teaching or suggestion in existence at the time the claimed invention was made that would have led one of ordinary skill in the art to combine the references in an attempt to form the invention. See MPEP §2143.01 and *In re Rouffet*, 47 USPQ.2d 1459 (Fed. Cir. 1997).

The Ma patent discloses a method for retrieving images from a database. The method includes performing a first search based on a user-generated query indicative of an image of interest. Images are retrieved from the database and displayed based on one or more features in the query. The user views the displayed images and indicates whether each of them is relevant or irrelevant. The relevant images are grouped into a first cluster and the irrelevant images into a second cluster. A correlation matrix is constructed to denote the relatedness (or lack thereof between the clusters) and weights may be assigned based on the correlation matrix.

Subsequent searches are performed based on the generated clusters. For example, if an image is retrieved during a second search and indicated to be relevant, then the entire cluster to which the image belongs may be deemed relevant. On the other hand, a user may exclude images from the relevant cluster. The Ma method thus continuously updates its relevant cluster based on recent user relevance information.

Claim 1 is different from the Ma patent in at least one respect. Claim 1 recites a data structure which includes both recent user feedback information and whole feedback information. As the Examiner acknowledged in the Office Action, the Ma patent fails to teach or suggest a data structure having whole feedback information. More specifically, the Ma patent does not teach or suggest a data structure used for determining weights of image features of an image search which includes all user feedback information input up to a current point in time. (See, for example, the disclosure at page 11, lines 1-3, of Applicants' specification).

To make up for these deficiencies, the Liddy patent was cited. The Liddy patent discloses a method for updating a neural network for retrieving "documents" from a database. (At column 5, lines 35-39, the Liddy patent discloses that these "documents" are HTML web pages.) To keep the neural network relevant, the neural network is periodically re-trained so that it is up-to-date. The manner in which the neural network is updated is disclosed as follows:

Periodically, the agent server 22 retrains (or trains) the artificial neural network common to all agents under an agent leader in accordance with the training set of relevant documents (step 54). The interval between training sessions may be a parameter set by the user. For example, the interval may be 15 minutes. When training is about to occur, if the user has not selected any relevant documents, the agent server 22 automatically performs relevance feedback at step 52 by considering the top X number of documents having the highest retrieval value as relevant and includes such documents in the training set by setting their relevancy bits in the database to "1". For example, X may be equal to 10, however other numbers may be used. If the user has selected less than X number of documents as relevant, the automatic relevant feedback may be performed to supplement the number of documents in the test set until X documents are present. (Emphasis added).

From the above, it is clear that the Liddy method performs a document search by initially training a neural network based on a set of training documents, and then periodically re-trains the neural network to reflect only the most recent user relevance feedback information. For example, once the neural network is initially trained, one or more document searches are performed. After 15 minutes has passed, the neural network is then re-trained, taking into consideration only the documents which a user has deemed relevant from searches performed over the last 15 minutes. From these disclosures, it is therefore clear that the neural network (which the Examiner appears to have called a data structure) disclosed in the Liddy patent is based only on recent user relevance information. The Liddy patent does not teach or suggest that its neural network is based on whole feedback information, e.g., all user feedback information input up to a current point in time. In fact, by disclosing that its neural network is re-trained every period, the Liddy patent at least implicitly teaches away from these features of the invention.

The Liddy patent also discloses that if the user has not selected any relevant documents in recent searches, an update of the neural network is performed any way. Thus, the neural network Liddy uses to perform web page searches is updated every period to reflect only the most current user relevance feedback information and this is the case under any circumstances.

In view of the foregoing considerations, it is respectfully submitted that the Ma and Liddy patents both individually and collectively fail to teach or suggest a data structure having "whole feedback information based on the user relevance information" recited in claim 1. Absent a

teaching or suggestion of this features, it is respectfully submitted that the first requirement of establishing a *prima facie* case of obviousness of claim 1 cannot be satisfied.

The second requirement for establishing a *prima facie* case of obviousness is that some teaching or suggestion must have existed at the time the claimed invention was made to modify the Ma method so that any data structure it uses to perform an image search includes both recent user feedback information and whole feedback information. None of the references of record provide such a teaching or suggestion. As noted above, the Liddy method uses only recent user feedback information to re-train the neural network it uses to perform document searches. Neither the Liddy patent nor the Ma patent itself teaches or suggests modifying a data structure which includes recent user feedback information for purposes of determining weight of image features to be used in an image search to also include whole feedback information to be used as a separate basis for determining these weights.

Because neither requirement for establishing a *prima facie* case of obviousness of claim 1 has been satisfied, it is respectfully submitted that claim 1 and its dependent claim are allowable over a Ma-Liddy combination.

The Examiner rejected claims 4 and 14-20 under 35 USC § 103(a) for being obvious in view of a combination formed among the Ma, Liddy, and Cohen patents. Applicants traverse this rejection for the following reasons.

Claim 4 depends from claim 1. In order to render claim 4 obvious, the Cohen patent must therefore teach or suggest the features of claim 1 missing from the Ma and Liddy patents. The Cohen patent discloses a browser for performing a keyword search of internet web sites. In performing this search, a matcher compares a parameter of the retrieved website address (URL) with a keyword of the search and provides a score of the relevancy therebetween.

The Cohen patent does not disclose including both recent user feedback information and whole feedback information in the same data structure, as recited in claim 1. Moreover, Cohen does not provide a teaching or suggestion for motivating one of ordinary skill in the art to modify a data structure including recent user feedback information to also include whole feedback information, so that, for example, weights of image features for performing image searches may be performed based on both types of information.

Because the Cohen patent does not provide a teaching or suggestion sufficient to satisfy either requirement for establishing a *prima facie* case of obviousness of claim 1 when combined with the Ma and Liddy patents, it is respectfully submitted that claim 1 is allowable over this combination. It is therefore submitted that claim 4 is allowable over this combination by virtue of its dependency from claim 1.

Applicants further submit that claim 4 is allowable based on the features separately recited therein. Claim 4 recites that the data structure of claim 1 further includes **reliability information indicating the reliability of the recent user feedback information and reliability information indicating the reliability of the whole feedback information**. The

Ma, Liddy, and Cohen patents fail to teach or suggest storing both feedback information and reliability information in the same data structure.

More specifically, the Cohen patent does not teach or suggest a data structure having both recent user feedback information and reliability information indicating how reliable the recent user feedback information is. To provide these features, the Examiner pointed to column 7, lines 51-56, of the Cohen patent. These lines of Cohen disclose providing a "score for a retrieved message, which reflects the relevancy and reliability of the message." These disclosures of Cohen make clear that a relevance score is assigned to the results of a keyword search performed by a web browser. Unlike the claimed invention, this score is not stored in a data structure which includes recent user feedback information used for determining weights of image features for an image search. Moreover, Cohen does not teach or suggest including both recent user feedback information and whole feedback information in the same data structure.

The Cohen patent also does not teach or suggest a data structure having both whole feedback information and reliability information indicating how reliable the whole feedback information is. To provide these features, the Examiner pointed to column 2, lines 45-64, of the Cohen patent. These disclosures of Cohen merely indicate that a score is generated for each result (website URL) of a web browser search, and that this score may be adjusted to determine how relevant the result is compared with a keyword used to perform the search. The Cohen patent does not disclose storing whole feedback information in the same data structure as

reliability information used to store information indicative of how reliable the whole feedback information is.

For at least the foregoing reasons, it is respectfully submitted that claim 4 is allowable over a Ma-Liddy-Cohen combination.

Claim 14 recites a method of determining weights of image features used for an image search based on user relevance feedback. This method includes, in step (a), providing a multimedia data structure including information describing features of a certain image, recent user feedback information for the image and whole feedback information for the image, and reliability information corresponding to the recent user feedback information and whole feedback information. In step (b), the method updates the recent user feedback information and whole feedback information and their reliabilities by learning them in response to the user relevance feedback. In step (c), the method determines weights of image features in proportion to the reliabilities of the recent feedback information, the whole feedback information, or both the recent feedback information and the whole feedback information. None of these features are taught or suggested by the Ma, Liddy, and Cohen patents.

Claims 16 and 17 both recite determining **reliability** of recent user feedback information. None of the references of record teach or suggest determining reliability for this type of information. Claim 16 further recites determining this reliability in proportion to the consistency of a recently used pattern or feedback. None of these features are taught or suggested by the

references of record. Claim 17 further recites determining the reliability of the whole feedback information in proportion to the number of feedback concerned in learning.

Claim 18 recites that the reliability of the whole feedback information is responsive to recorded user usage records wherein the recorded user usage records provide feedback to the reliability of the whole feedback information without user interaction. None of these features are taught or suggested by the references of record.

Claim 19 recites a multimedia data structure reflecting change of a user relevance feedback for determining weights of image features used for an image search. This structure includes information describing at least one feature of a certain image, recent user feedback information based on user relevance feedback, whole feedback information based on the user relevance feedback, and reliability information indicating reliability of at least one of the user feedback information and whole feedback information. None of the references of record teach or suggest including both recent user feedback information and whole feedback information in the same data structure, nor do they teach or suggest reliability information of the type recited in claim 19.

Claim 20 recites that the reliability information indicates reliability of both of the user feedback information and the whole feedback information. None of the references of record teach or suggest these features.

Reconsideration and withdrawal of all the rejections and objections made by the Examiner is hereby respectfully requested.

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance of the application is respectfully requested.

Should the Examiner believe that further amendments are necessary to place the application in condition for allowance, or if the Examiner believes that a personal interview would be advantageous in order to more expeditiously resolve any remaining issues, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in fees due in connection with this application, including extension of time fees, to Deposit Account No. 16-0607 (Attorney Docket No. HI-0019) and credit any excess fees to the same Deposit Account.

Respectfully submitted,



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